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Delinquency, depression, and substance use disorder among child welfare-involved adolescent females

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Abstract

Although adolescents with delinquency are known to have higher-than-average rates of depression or substance use disorder (SUD), research on the topic is inconsistent. It remains unclear whether depression or SUD leads to delinquency, whether delinquency leads to depression or SUD, or whether there is bi-directionality. Utilizing the National Survey of Child and Adolescent Well-Being (Wave I: 2008–2009; Wave II: 18 months later: $N = 5872$), we used logistic regression to predict depression from delinquency (and vice versa), and SUD from delinquency (and vice versa). After inclusion of control variables, we found that females with minor theft in Wave I were more than 4 times as likely (adjusted odds ratio [aOR] = 4.34; 95% CI: 1.10–17.16) as females without minor theft to be depressed in Wave II, and those with public disorder in Wave I were almost 3 times as likely (aOR = 2.74; 95% CI: 1.03–7.30) as those without public disorder to have SUD in Wave II. Overall delinquency also predicted depression or SUD, and SUD predicted delinquency. Practitioners could address risk for depression or SUD among child welfare-involved adolescent females by focusing on overall delinquency or on specific types of delinquency (minor theft for depression and public disorder for SUD) and by offering interventions (e.g., cognitive-behavioral psychotherapy) that have been shown to be effective in preventing depression or SUD. In addition, with respect to our finding that SUD predicts delinquency among adolescent females, practitioners can help prevent delinquency by offering interventions (e.g., intensive outpatient treatments) that have well documented effectiveness in addressing SUD.

Keywords

Delinquency; Depression; Substance use; Adolescent; Child welfare

Several theories of delinquency (Zembofski, 2011), including anomie, social structure, and strain theory, suggest that traditionally disadvantaged populations such as child welfare-involved adolescents can sometimes enhance their economic and social status by engaging in criminal activity. Such activity is often accompanied by substance use disorder (SUD) or depression (Angold, Costello, & Erkanli, 1999; Boesky, 2002; Capaldi, 1991, 1992; Capaldi & Stoolmiller, 1999; Cocozza and Skowrya, 2000; Greene et al., 2002; Steiner & Cauffman, 1998; Stoep, Evens, & Taub, 1997; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002;

Wasserman, McReynolds, Larkin, Fisher, & Santos, 2002; Wolff & Ollendick, 2006). However in relation to child welfare-involved adolescents or even among adolescents more generally, the ways in which delinquency relates to SUD or depression are unclear. For example, evidence suggests that early SUD can lead to delinquency (Brook, Whiteman, Finch, & Cohen, 1996), but other studies suggest that the opposite is true (i.e., delinquency can lead to SUD: Deitch, Koutsenok, & Ruiz, 2000; Elliott, Huizinga, & Menard, 1989; Kandel, Davies, Karus, & Yamaguchi, 1986). Similarly, some studies suggest that depression can lead to delinquency (Hawkins et al., 1998; Mallet, Stoddard-Dare, & Seck, 2009; Overbeek, Vollebergh, Meeus, Engels, & Luijpers, 2001), but other researchers make the opposite claim (Patterson, Reid, & Dishion, 1992; Rohde, Lewinsohn, & Seeley, 1991). Still other investigators (Ge, Best, Conger, & Simons, 1996; Kofler et al., 2011; Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002; Rohde et al., 1991; Weisner & Kim, 2006) examine two-way trajectories, such as the ways in which depression can lead to delinquency and vice versa. However evidence on this bi-directionality is mixed. Some studies (Guibord, Bell, Romano, & Rouillard, 2011; Hops, Lewinsohn, Andrews, & Roberts, 1990) found that delinquency predicts depression but not vice versa, but other studies (Beyers & Loeber, 2003) indicate that the reverse is true (i.e., depression predicts delinquency but not vice versa). Thus it is unclear whether depression or SUD leads to delinquency, or whether the opposite is true, or whether both are true.

Using the National Survey of Child and Adolescent Well-Being-II (NSCAW: Wave I: 2008–2009; Wave II: 18 months later: $N = 5872$; National Data Archive on Child Abuse and Neglect, 2011), our study sought to untangle relationships between delinquency, depression, and SUD among adolescents. We therefore used delinquency as an explanatory variable in some analyses and as an outcome in other analyses.

In addition, whereas most studies examine delinquency as a whole and its relation to depression or SUD, we sought to differentiate the specific types of delinquent behaviors (e.g., felony assault, minor theft) that most increase vulnerability for adverse outcomes. In other words, we focused on both overall delinquency and on specific offenses in order to address differences in choice to study one versus the other. For instance, even though overall delinquency is investigated frequently, some evidence (U.S. Department of Justice, 1991) suggests that types of specific offenses differ in males versus females. Similarly, one study (Colins, Vermeiren, Schuyten, & Broekaert, 2009) found that SUD was common in all types of delinquent behavior, but it was much more common among property offenders (present in 86%). Thus there is evidence to support focus on both general delinquency and on specific offenses. In relation to adolescents, we therefore hypothesized that some types of delinquent behavior are associated with depression or SUD to a greater extent than other types of delinquent behavior. Perhaps practitioners can address needs of youth with specific law violations as a way of complimenting service provision for delinquency as a whole. In short, without overlooking the problem of delinquency more generally, a focus on only a few high-risk delinquent behaviors might be especially helpful in efforts to proactively address adolescent depression or SUD.

Furthermore, our study differed from many studies on the topic by focusing on child welfare-involved youth. Because of reported maltreatment (i.e., allegations of child abuse or

neglect) and because of the introduction of child welfare professionals into the lives of these children (i.e., increased access to practitioners in social service systems), child welfare-involved youth are likely to differ from the larger population of youth (largely without child abuse or neglect) or from youth in juvenile justice or child mental health systems (who may or may not have been involved in the child welfare system). Child welfare-involved youth have heightened rates of delinquency, depression, and SUD (Currie & Tekin, 2006; Mersky & Reynolds, 2007; Stuewig & McCloskey, 2005; Wall & Kohl, 2007).

Gender differences and female delinquency

All of our analyses are gender-differentiated because of well-documented differences between male and female adolescents in depression, SUD, and delinquency. We present only our findings on females. Most males were not depressed, very few had both depression and delinquency, and SUD and delinquency were unrelated. These findings are in themselves interesting. In males, there does not appear to be an association between delinquency and either depression or SUD.

In relation to females, recent national statistics underscore growing crime rates among adolescents. For instance, between 1980 and 2000, arrests for young females have increased by 35% compared to an 11% decrease among young males (Snyder, 2002). Moreover, in relation to male adolescents with delinquent behaviors, studies suggest that a greater number of female counterparts have severe mental illness (Dakof, 2000; Espelage, Holt, & Henkel, 2003; McCabe, Lansing, Garland, & Hough, 2002; Myers, Burket, Lyles, Stone, & Kempf, 1990; Timmons-Mitchell et al., 1997; Ulzen & Hamilton, 1998). There is substantial deliberation about the extent to which knowledge generated from male-focused samples generalizes to female populations (Miller, Malone, Dodge, & the Conduct Problems Prevention Research Group, 2010). Although some scholars argue for the application of male-driven findings to female delinquent behaviors (Bloom, 2003; Chesney-Lind & Pasko, 2004; Silverthorn & Frick, 1999), others suggest that existing models are inadequate to shed light on adolescent female behaviors (Fergusson & Horwood, 2002; Moffitt, Caspi, Rutter, & Silva, 2001).

Nevertheless, female delinquency is clearly an important problem that spans mental health, substance abuse, child welfare, and juvenile justice systems. Yet little is known about the relationship between delinquency, depression, and SUD among female adolescents, as most studies have focused on males only (Miller et al., 2010), and greater specificity is needed on how depression or SUD can lead to particular types of delinquent behavior (or vice versa) among young females with delinquency.

Study purpose

Among child welfare-involved females, we sought to determine whether delinquency predicts depression or SUD, whether depression or SUD predicts delinquency, or whether there is bi-directionality. Given aforementioned findings on the bi-directionality of relationships between depression, SUD, and delinquency, we hypothesized that we would find the associations illustrated in our conceptual framework (see Fig. 1). We also conjectured that specific types of delinquent behavior might increase risk of SUD or

depression to a greater extent than other types of delinquent behavior, although information was unavailable for formulation of more specific hypotheses.

Method

Dataset

The NSCAW-II is a longitudinal dataset containing information on a nationally representative sample of 5872 youth (ages 0–18) who have undergone a formal Child Protective Services investigation stemming from a child abuse or neglect report (either substantiated or unsubstantiated). Sponsored by the Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, the NSCAW-II includes data on the functioning, service needs, and service use of children who have come in contact with the child welfare system. Information is available on the child's health, mental health, social functioning, academic achievement, development, and family, and on the investigation of abuse or neglect. Children were sampled from child welfare investigations closed between February 2008 and April 2009 in 83 counties. Interviews were conducted with children, parents, nonparent adult caregivers (e.g., foster parents), and caseworkers. Among the 5872 youth, 3017 were male and 2855 were female (0–2 years of age: 2937; 3–5 years: 828; 6–10 years: 1053; 11+ years: 1054), where 2003 were white, 1827 were black, 1614 were Hispanic, and 428 were of another ethnicity. Information on health (physical and mental), social functioning, academic achievement, and behavioral adjustment was collected from children and their current caregivers, caseworkers, and teachers. For our purposes, the original sample of 5872 youth was reduced to numbers shown in the tables (sample description is also included). The sample was restricted to females over the age of 11 because of data unavailability for some of our variables in younger children (e.g., low rates of SUD or delinquency), and youth with missing data on any of the variables were excluded from the analyses. Youth included in our analyses resembled those in the larger NSCAW dataset. For example, in the full dataset (Casanueva, Smith, Dolan, & Ringeisen, 2011), 42% were White, 87% were in in-home care, and 27% had physical abuse reports, but in our sample 41–43% were White, 90–91% were in in-home care, and 25–26% had physical abuse reports (depending on the analysis).

Wave 2 is a follow-up of children and families about 18 months after the NSCAW II index investigation. Data for Wave 2 were collected from October 2009 to January 2011 and included 4750 youth (17% weighted attrition). After complete description of the study to the participants, written informed consent was obtained. We obtained IRB approval for use of the data.

Depression or SUD

Depression was indicated if young females scored in the clinical range (above 65) on the Children's Depression Inventory (CDI; Kovacs, 1985). The CDI contains 27 3-point items, and has adequate internal consistency (Ivarsson, Svalander, & Litlere, 2006). Substance abuse or dependence (i.e., SUD) was indicated if females met DSM-IV criteria using Audio Computer Assisted Self Interviewing components (National Data Archive on Child Abuse and Neglect, 2011).

Delinquency

Adolescent females were asked to report the number of times (*1–5 or more*) in the past six months that they engaged in 36 illegal activities on the Self-Report of Delinquency (SRD; Elliott & Ageton, 1980). The SRD has adequate test-retest reliability and internal consistency (Dunford & Elliott, 1984). From the total number of delinquent acts (i.e., with a ceiling of 5 times 36 or 180), we created a binary variable indicating delinquency (top quartile of delinquent acts) versus lack thereof (bottom 3 quartiles). Although Elliott and Ageton (1980) examine delinquency as a continuous variable using the SRD, we used a binary definition in order to more clearly distinguish the highest risk adolescents from those with fewer illegal activities.

The SRD contains subscales for nine types of delinquent behavior, including felony assault, felony theft, robbery, fraud, minor theft, illegal services, property damage, public disorder, and status offenses. Because few youth engaged in these behaviors more than 2 or 3 times in the past six months, we recoded all of them into binary variables (presence vs. absence of each) except for status offenses (e.g., running away, truancy) that occurred more frequently and was recoded into three categories (0, 1–5, 6 or more) in one of the analyses. Because few youth engaged in felony theft, robbery, fraud, or illegal services, we collapsed these four behaviors into a single variable (*other*). We did not include felony theft in the same category as minor theft because they differ substantially. Felony theft is over \$500 in most states but minor theft in the NSCAW includes, for example, stealing items under \$50, shoplifting, and pickpocketing. Thus we report a total of six delinquent behaviors, including minor theft, felony assault (e.g., attacked with intent to hurt, had or tried to have sexual relations without consent), property damage (e.g., fire starting), public disorder (e.g., loud, rowdy, drunk, or unruly in public places; carried a hidden weapon), status offenses (e.g., ran away, skipped school), and other offenses.

Control variables

In our predictions of depression or SUD (in Wave II) from delinquency (in Wave I), and in our analyses reversing this causal direction, we included a wide variety of control variables. In addition to demographic characteristics (child age: 11–12; 13–16; child race/ethnicity: white, black, other), we adjusted for: (a) poverty in the child's household (above vs. below the federal poverty threshold), for the effects of poverty on depression, SUD, or delinquency are well documented (e.g., APA Task Force on Childhood Poverty, 2013); (b) child welfare information (living arrangement: in-home vs. out-of-home care; type of reported child maltreatment: physical abuse, neglect), for out-of-home care or physical abuse, for example, can increase risk of adverse outcomes (e.g., McDonald, Allen, Westerfelt, & Piliavin, 1997); (c) child welfare worker report of current presence versus absence of five family-related risk factors (high stress in the family, serious mental illness in a designated primary caregiver, poor parenting skills in the primary caregiver, inappropriate or excessive discipline by the primary caregiver, presence of arrest history in the primary caregiver), for family hardship can increase vulnerability for depression, SUD, or delinquency (e.g., Lempers, Clark-Lempers, & Simons, 1989); (d) child welfare worker report of depression, anxiety, or other emotional problems in the child in order to control for mental illness in Wave I in predictions of depression or SUD in Wave II; (e) child welfare worker report of child SUD

in Wave I when predicting SUD in Wave II; and (f) social support in the child's family using an NSCAW-adapted version of the Duke-University of North Carolina Functional Social Support Questionnaire (Broadhead, Gehlback, deGruy, & Kaplan, 1998). It measured availability of assistance (e.g., help with child-rearing), and has adequate internal consistency (Broadhead et al., 1988). Given the ways in which social support can help prevent adverse outcomes (e.g., Bandy, Andrews, & Moore, 2012), we adjusted for its potential influence on depression, SUD, or delinquency.

Analysis

After first using cross-tabulations and chi-square tests of association to explore bivariate relationships between depression in Wave II and each of the Wave I covariates (including delinquency), and between SUD in Wave II and each of the Wave I covariates, adjusted logistic regression was used to predict depression from all of the Wave I covariates together (including delinquency) and SUD from all of the Wave I covariates together.

Next, we reversed the direction of these analyses by predicting delinquency in Wave II from depression in Wave I and (separately) SUD in Wave I (first in bivariate and then in multivariate equations using the aforementioned control variables). Using complex survey design measures, all analyses (two-tailed) applied sampling weights to the data in order to adjust for non-response and for varying probabilities of selection (including those resulting from oversampling).

Results

Predicting depression in Wave II from delinquency in Wave I

In predicting depression from prior delinquency, there were 253 females who met our inclusion criteria (over age 10; without missing data on any of the variables in Table 1). In accordance with a study by Aarons, Brown, Hough, Garland, and Wood (2001), which found an 11% rate of past-year depression among child welfare-involved youth, about 12% of females in the NSCAW sample were depressed in Wave II. After adjusting for all Wave I covariates in Table 1, five factors were significant predictors of depression. First, females in out-of-home care were almost 4 times as likely (adjusted odds ratio [aOR] = 3.74; CI: 1.06–13.17) to be depressed as those living at home. Second, in relation to females with physical abuse reports, those who were investigated for other types of maltreatment were 4 times less likely (aOR = .24; CI: .08–.68) to be depressed. Third, females with primary caregivers who had a serious mental illness at the time of the investigation were 3 times as likely (aOR = 3.08; CI: 1.01–9.40) to be depressed than counterparts without serious mental illness in a designated primary caregiver. Fourth, females with delinquency (past six months: total scale score) were almost 3 times as likely (aOR = 2.77; CI: 1.09–7.03) as other females to be depressed. Fifth, females with minor theft in the past six months were more than 4 times as likely (aOR = 4.34; CI: 1.10–17.16) as other females to be depressed.

Predicting SUD in Wave II from delinquency in Wave I

In predicting SUD from prior delinquency, there were 273 females who met our inclusion criteria (over age 10; without missing data on any of the variables in Table 2). In general

accordance with research by the Tennessee Commission on Children and Youth (2008), which found a 24% rate of substance abuse among child welfare-involved youth over the age of 11, about 20% of young females met DSM-IV criteria for SUD in Wave II of the NSCAW. After adjusting for all Wave I covariates in Table 2, five factors were significant predictors of SUD. First, females between the ages of 13 and 16 were 3 times as likely ($aOR = 3.02$; CI: 1.07–8.53) as those between the age of 11 and 12 to have SUD. Second, females with primary caregivers with a serious mental illness were almost 3 times as likely ($aOR = 2.75$; CI: 1.00–7.55) to have SUD as counterparts without serious mental illness in a designated primary caregiver. Third, females with SUD in Wave I were 6 times as likely ($aOR = 5.94$; CI: 2.50–14.14) to have SUD in Wave II. Fourth, females with delinquency (total scale score) were more than twice as likely ($aOR = 2.38$; CI: 1.01–5.63) as other youth to have SUD. Fifth, females with public disorder in the past 6 months were almost 3 times as likely ($aOR = 2.74$; CI: 1.03–7.30) as other youth to have SUD.

Predicting delinquency in Wave II from depression in Wave I

Even in bivariate analysis, delinquency was not significantly associated with prior depression (not shown in tables). In predicting delinquency in Wave II from depression in Wave I, there were 520 females who met our inclusion criteria (over age 10; without missing data on our independent or dependent variables). We had more females in this bivariate analysis than in prior multivariate analyses because in prior analyses we had to exclude people with missing data on control variables. Among the 520 individuals, 279 (54% weighted) had delinquency in Wave II. This 54% delinquency rate is in general accordance with prior child welfare research by Ireland, Smith, and Thornberry (2002) (17% occasional and 62% chronic delinquency among adolescents: 2002). Among the 279 with delinquency, 7.4% (weighted) had depression in Wave I. Among the 241 without delinquency, 5.0% (weighted) had depression in Wave I.

Predicting delinquency in Wave II from SUD in Wave I

In predicting delinquency from prior SUD, there were 328 females who met our inclusion criteria (over age 10; without missing data on any of the variables in Table 3). After adjusting for all of the covariates in the table, only two factors were statistically significant: (a) older females (13–16) were twice as likely ($aOR = 1.99$; CI: 1.16–3.4) as younger females (11–12) to have delinquency in Wave II; and (b) females with SUD in Wave I were more than 3 times as likely ($aOR = 3.21$; CI: 1.75–5.87) as those without SUD to have delinquency in Wave II.

In predicting delinquency in Wave II, we did not find a statistically significant interaction between depression and SUD in Wave I. Significant associations (after adjusting for all of the control variables) between delinquency, depression, and SUD in females are illustrated in Fig. 2.

Discussion

Findings substantiate prior research (Guibord et al., 2011; Kofler et al., 2011) linking delinquency to subsequent depression in female adolescents, much as our results

substantiate prior research (Deitch et al., 2000; Elliott et al., 1989; Kandel et al., 1986) linking delinquency to subsequent SUD. A seemingly unique contribution of our study is our delineation of specific types of delinquent behavior (minor theft, public disorder) among females that significantly increase the risk of depression or SUD after controlling for a wide variety of factors and after controlling for all of the different types of delinquent acts. More specifically, we found that minor theft quadrupled the likelihood of adolescent depression among females after inclusion of control variables, and that public disorder almost tripled the risk of SUD among adolescent females even after controlling for SUD in Wave I. In short, our findings differed from results of similar studies by underscoring these two specific types of delinquent behavior (minor theft in depression; public disorder in SUD, in addition to overall delinquency) that increase risk for depression or SUD outcomes. Furthermore, our focus on child welfare-involved adolescents (with high rates of delinquency, SUD, and mental illness, relative to the general population) complements similar studies on adolescents more generally or those in juvenile justice or mental health systems (who may or may not be child welfare-involved).

We also contributed to the literature by examining whether delinquency predicts SUD or vice versa. Some research (Brook et al., 1996) suggests that SUD predicts delinquency, and other studies suggest that the reverse is true (i.e., delinquency predicts SUD: Deitch et al., 2000; Elliott et al., 1989; Kandel et al., 1986). This raises the question of whether the link is bidirectional or whether it works in one direction but not the other. Our findings substantiate research on the link between delinquency and subsequent SUD in females who are child welfare-involved, and also suggest that the reverse is true (SUD predicts delinquency).

In short, our research has begun to untangle the complicated relationships between delinquency, depression, and SUD in adolescent females (who are child welfare-involved), but more research is needed in order to fully understand these associations. In particular, we found that some of our control variables were also significant predictors of our outcomes, and future investigations should explore in greater detail the number and nature of multiple risk factors, and more generally the complexity of relationships between child welfare variables, delinquency (including specific types of delinquency), and the clinical factors of depression or SUD.

One limitation of this study is that, as a result of sample size constraints, we had to collapse some of the categories in the study variables by creating dichotomous categories. In addition, because we had to restrict our sample to females, to youth over the age of 11, and to youth without missing data, we had to exclude large numbers of youth in the NSCAW. However we found that youth in our samples were similar to the larger population in the NSCAW in relation to ethnicity, rates of placement in in-home versus out-of-home care, and rates of physical abuse. Furthermore, due to the sensitive nature of the information collected from young females about their delinquent behaviors and SUD, there could be issues with self-report. There may have been response bias, problems with recall, or inaccuracies in coding or recording of the secondary data.

Future studies could benefit from larger samples of youth in the child welfare system, and could also focus on males. These studies could focus on types of delinquency (e.g., minor

theft, public disorder), and whether these specific behaviors predict depression or SUD in youth more generally (i.e. those not involved in the child welfare system) or those in the juvenile justice or mental health systems. Furthermore, future studies might beneficially examine all of these topics among children in out-of-home-care versus in-home care. Finally research is needed that examines the reasons why child welfare-involved adolescents engage in delinquent activity, and why such activity is linked in many cases to depression or SUD. Studies that increase understanding of these motivations and relationships can be used to test theories of delinquency (Zembroski, 2011). Perhaps, like other traditionally disadvantaged populations, child welfare-involved adolescents strive to enhance their economic and social status by engaging in criminal activity, as anomie, social structure, and strain theory suggest. If so, helping professionals could explore these motivations in order to help prevent delinquent activities, especially if SUD is present. If SUD is not present, and if delinquency is not prevented, then our findings suggest that delinquency behaviors can lead to SUD or depression.

Practitioners could address risk for depression or SUD among adolescent females by focusing on the nature of delinquency as well as overall delinquency. More specifically, in order to help prevent depression or SUD, practitioners could: (a) examine the presence and nature of delinquency using the NSCAW-II delinquency assessment and (b) use evidence-based practices such as cognitive-behavioral treatments, for example, to effectively and proactively address depression or SUD. (Clarke, Rohde, Lewinsohn, Hops, & Seeley, 1999; Curry, Wells, Lochman, Craighead, & Nagy, 2003; National Institute on Drug Abuse, 2010; National Institute of Mental Health, 2012; Seligman, Schulman, DeRubeis, & Hollon, 1999). In this particular population of child welfare-involved adolescents, screenings for delinquency will yield a higher-than-average number of at-risk persons, given the well-documented link between child maltreatment and delinquency, and among these delinquent adolescents, a higher-than-average number will develop depression or SUD because of the known link between child maltreatment and mental illness or drug addiction. Thus targeting and intervention efforts are especially needed in the child welfare population.

In relation to our finding that SUD predicts delinquency among child welfare-involved adolescent females, practitioners can focus on females with SUD (using the DSM or other substance abuse screening instruments) in order to prevent juvenile or criminal justice system involvement. Interventions such as intensive outpatient treatment, residential stay, or self-help have well documented effectiveness in addressing SUD. Efforts to target high-risk adolescents with SUD are needed especially among child welfare-involved adolescents, given the increased prevalence of SUD in this population of maltreated individuals, and preventative interventions are especially needed to avert delinquency in such individuals because they have elevated risk of juvenile or criminal justice system involvement.

Conclusions

Among adolescent females, we found that specific types of delinquent behavior in Wave I (minor theft, as well as overall delinquency) predict depression in Wave II, and that specific types of delinquent behavior in Wave I (public disorder, as well as overall delinquency) predict SUD in Wave II even after adjusting for a wide variety of control variables. More

specifically, in relation to particular types of delinquent behavior, adolescent females with minor theft in Wave I were more than 4 times as likely as those without delinquency to be depressed in Wave II, and that females with public disorder in Wave I were almost 3 times as likely as those without delinquency to have SUD in Wave II. We also found that SUD in Wave I predicts delinquency in Wave II, for females with SUD were more than 3 times as likely as other females to have subsequent delinquency. In short, our research has begun to untangle the complicated relationships between delinquency, depression, and SUD in adolescent females (who are child welfare-involved).

Practitioners could address risk for depression and SUD among adolescent females by using the NSCAW-II delinquency assessment to screen for overall delinquency or for specific types of delinquency (minor theft for depression and public disorder for SUD) and by offering interventions (e.g., cognitive-behavioral psychotherapy) that have been shown to be effective in preventing depression or SUD. In addition, with respect to our finding that SUD predicts delinquency among adolescent females, practitioners can help prevent juvenile or criminal justice system involvement by offering interventions (e.g., intensive outpatient treatments) that have well documented effectiveness in addressing SUD among child welfare-involved adolescent females who have been identified as having SUD. Efforts to assess and address SUD, depression, and delinquency are needed especially in child welfare-involved populations because of the well-documented link between child maltreatment and these adverse risk factors and outcomes.

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Fig. 1.
Conceptual framework.

Fig. 2.

Associations¹ between depression, substance use disorder and delinquency in female adolescents, after adjusting for a wide variety of control variables².

¹ Associations (adjusted odds ratios or AORs with confidence intervals or CIs) refer to logistic regression models predicting: (1) depression in Wave II (18 months later) from delinquency in Wave I (2008–2009); (2) substance use disorder in Wave II from delinquency in Wave I; (3) delinquency in Wave II from depression in Wave I; or (4) delinquency in Wave II from substance use disorder in Wave I.

² Control variables in Wave I include child age, child race/ethnicity, poverty in the child's household, child living arrangement (in-home versus out-of-home care), type of reported child maltreatment (physical abuse, neglect, other), high stress in the family, serious mental illness in the primary caregiver, poor parenting skills in the primary caregiver, inappropriate or excessive discipline by the primary caregiver, presence of arrest history in the primary caregiver, perceived social support in the child's family, and depression, anxiety, or other emotional problems in the child. In predictions of Wave II substance use disorders we also controlled for presence of substance use disorders in Wave I.

* $p < .05$; *** $p < .001$.

Table 1

Risk of depression among 253 females with child welfare system contacts in the National Survey of Child and Adolescent Well-Being II, by presence versus absence of delinquency or types of delinquency.

	Number of youth with child welfare system contacts, Wave I (2008–2009)	Weighted percent	Weighted percent with depression, Wave II (18 months later)	Adjusted odds ratio	95% confidence interval
All	253	100	11.7	–	–
Child age					
11–12	99	40	7.2	–	–
13–16	154	60	14.7	1.55	.60–4.02
Child race/ethnicity					
White	107	43	10.1	–	–
Black	65	26	10.3	.78	.25–2.40
Other	81	32	15.0	2.09	.75–5.77
Poverty in child's household (under the federal poverty threshold)					
No	125	49	13.1	1.28	.52–3.17
Yes	128	51	10.3	–	–
Living arrangement					
In-home care	231	91	10.7	–	–
Out-of-home care	22	9	22.9	3.74*	1.06–13.17
Type of reported maltreatment					
Physical abuse	64	25	21.2	–	–
Neglect	63	25	9.6	.36	.11–1.25
Other	126	49	7.9	.24**	.08–.68
High stress in the family					
No	123	48	13.7	2.19	.82–5.84
Yes	130	52	9.8	–	–
Presences of serious mental illness in primary caregiver					
No	207	81	9.8	–	–
Yes	46	19	20.0	3.08*	1.01–9.40
Poor parenting skills in primary caregiver					
No	190	75	11.9	1.26	.35–4.58

	Number of youth with child welfare system contacts, Wave I (2008–2009)	Weighted percent	Weighted percent with depression, Wave II (18 months later)	Adjusted odds ratio	95% confidence interval
Yes	63	25	11.0	–	–
Presences of inappropriate or excessive discipline in primary caregiver					
No	223	88	11.0	1.65	.30–9.05
Yes	30	12	16.6	–	–
Presence of arrest history in primary caregiver					
No	175	69	10.7	.52	.19–1.40
Yes	78	31	14.0	–	–
Presence of depression, anxiety, or other emotional problems in the child					
No	179	71	11.0	1.28	.47–3.45
Yes	74	29	13.4	–	–
Perceived social support for child and family					
Lowest quartile	81	32	12.0	–	–
Second quartile	62	24	14.3	1.05	.34–3.27
Third or fourth quartile	110	43	10.0	.88	.30–2.57
Model I: Overall delinquency					
Presence of delinquency					
No	172	68	8.0	–	–
Yes	81	32	20.0	2.77*	1.09–7.03
Model II: Type of Delinquency					
Felony assault					
No	234	93	10.2	–	–
Yes	19	7	31.1	1.93	.49–7.63
Minor theft					
No	223	88	9.6	–	–
Yes	30	12	27.5	4.34*	1.10–17.16
Property damage					
No	237	94	10.0	–	–
Yes	16	6	36.8	1.68	.40–7.12
Public disorder					
No	198	78	8.4	–	–

	Number of youth with child welfare system contacts, Wave I (2008–2009)	Weighted percent	Weighted percent with depression, Wave II (18 months later)	Adjusted odds ratio	95% confidence interval
Yes	55	22	23.4	2.22	.65–7.56
Status offenses					
None	182	72	9.8	–	–
1–5	58	23	12.2	.48	.11–2.13
6 or more	13	5	37.3	1.83	.29–11.43
Other					
No	232	92	10.6	–	–
Yes	21	8	23.7	.51	.09–3.10

* $p < .05$.
 ** $p < .01$.

Table 2

Risk of DSM-IV substance use disorder among 273 females with child welfare system contacts in the National Survey of Child and Adolescent Well-Being II, by presence versus absence of delinquency or types of delinquency.^a

	Number of youth with child welfare system contacts, Wave I (2008–2009)	Weighted percent	Weighted percent with substance use disorder, Wave II (18 months later)	Adjusted odds ratio	95% confidence interval
All	273	100	19.7	–	–
Child age					
11–12	94	35	6.3	–	–
13–16	179	65	27.0	3.02*	1.07–8.53
Presences of serious mental illness in primary caregiver					
No	223	19	16.7	–	–
Yes	50	81	32.5	2.75*	1.00–7.55
Presence of DSM-IV substance use disorder in Wave I					
No	218	80	10.5	–	–
Yes	55	20	56.7	5.94***	2.50–14.14
Model I: Overall delinquency					
Presence of delinquency					
No	180	66	10.5	–	–
Yes	93	34	37.7	2.38*	1.01–5.63
Model II: Type of delinquency					
Felony assault					
No	254	93	17.7	–	–
Yes	19	7	47.8	1.06	.23–4.86
Minor theft					
No	240	88	15.6	–	–
Yes	33	12	49.3	1.35	.38–4.81
Property damage					
No	258	94	17.2	–	–
Yes	15	6	61.4	3.76	.89–15.87
Public disorder					
No	215	78	11.3	–	–

	Number of youth with child welfare system contacts, Wave I (2008–2009)	Weighted percent	Weighted percent with substance use disorder, Wave II (18 months later)	Adjusted odds ratio	95% confidence interval
Yes	58	22	50.1	2.74*	1.03–7.30
Status offenses					
No	192	71	12.2	–	–
Yes	81	29	37.8	1.70	.69–4.22
Other					
No	251	92	16.7	–	–
Yes	22	8	54.3	1.70	.69–4.22

^aControl variables that were not statically significant were not included in the table (child race/ethnicity; household poverty; living arrangement (in-home versus out-of-home care); type of maltreatment; high stress in the family; poor parenting skills in the primary caregiver; presence of inappropriate or excessive discipline in primary caregiver; presence of arrest history in the primary caregiver; presence of depression, anxiety, or other emotional problems in the child; perceived social support for the child and family).

*
 $p < .05$.

 $p < .001$.

Table 3

Risk of delinquency among 328 females with child welfare system contacts in the National Survey of Child and Adolescent Well-Being II, by presence versus absence of DSM-IV substance use disorders.^a

	Number of youth with child welfare system contacts, Wave I (2008–2009)	Weighted percent	Weighted percent with delinquency, Wave II (18 months later)	Adjusted odds ratio	95% confidence interval
All	328	100	40.8	–	–
Child age					
11–12	113	35	27.3	–	–
13–16	215	65	48.0	1.99*	1.16–3.42
Presence of depression, anxiety, or other emotional problems in the child					
No	236	72	39.3	1.05	.60–1.84
Yes	92	28	44.5	–	–
Presence of DSM-IV substance use disorder in Wave I					
No	262	80	34.2	–	–
Yes	66	20	66.9	3.21***	1.75–5.87

^aControl variables that were not statically significant were not included in the table (child race/ethnicity; household poverty; living arrangement (in-home versus out-of-home care); type of maltreatment; high stress in the family; presence of serious mental illness in the primary caregiver; poor parenting skills in the primary caregiver; presence of inappropriate or excessive discipline in primary caregiver; presence of arrest history in the primary caregiver; presence of depression, anxiety, or other emotional problems in the child).

*
 $p < .05$.

 $p < .001$.